

DRILLING SITE EVALUATION OUTLINE

(Local Health Department Activities)

This outline was developed to aid the sanitarian in conducting an evaluation during the construction of a water well.

1. Permits

- a. Was a permit issued for the site?
- b. Were there any restrictions or conditions listed on the permit?
- c. Did the drilling contractor see the permit and is he aware of the permit conditions?

2. Registration

- a. Is the drilling contractor registered?
 1. Check MDEQ directory.
 2. Contractor's registration card - in possession.
- b. Is the drilling rig registered?
 1. Check for current decals on both sides of rig.
 2. Check for contractor's registration number (or name) on both sides of rig.
 3. Rig registration card - should be present in rig.

3. Drilling Site Location

- a. Is the well location adequately isolated from sources of contamination and does location comply with permit conditions?
- b. Will the well be accessible for maintenance?
- c. Is the drilling site isolated from utility lines (buried and overhead)? Was MISS DIG contacted prior to drilling?

4. Drilling Method

- a. What type of drilling method is being used? (cable tool, rotary, auger, hollow rod, jetting, driving)

5. Well Records

- a. Is driller routinely checking cuttings samples?
- b. Is driller recording geologic information? (check cuttings around site or in mud tank)
- c. Record date, location, owner's name, contractor's name to check on well record submittal.

6. Well Construction Details

a. Grouting

1. What depth of grouting is required on this site?
2. What type of grouting material will be used? (neat cement - bentonite)
3. What water-to-grout ratio will the contractor use? (Is proper grout density achieved? check with mud scale,)
4. What grouting method will be used?
5. Is the proposed grouting method consistent with the grouting material, drilling method, borehole size, etc.?
6. Does the contractor have necessary grouting equipment (mixer, pump, grout pipe, hoses) and materials at the drilling site?
7. Does grout material appear at surface when pumping grout through tremie pipe or down casing?

8. Is grout placed around casing as it is being driven (cable tool, jetting, hollow rod)?

b. Well Casing

1. Is approved material being used as well casing? (steel or PVC plastic)
2. Check casing markings - (ASTM spec., weight/ft., wall thickness, manufacturer or supplier's name).
3. Are proper installation methods being used?

c. Well Screen

1. What type of screen is being used?
2. How is the screen installed?
3. What types of fittings will be used? (k-packer, washdown fittings, etc.)
4. What slot size will be used?

d. Drilling Water

1. Was drilling water obtained from an approved source?
2. Is drilling water chlorinated? (check chlorine residual)

e. Well Development

1. Which development method will be used (air, surge block, baler, plunger, water jetting, overpumping)?
2. Is final well capacity adequate for the intended use?
3. Is water free of sand and turbidity upon completion of development?

f. Well Disinfection

1. What disinfection method is used?
2. What type of disinfectant is used? (liquid bleach, granular chlorine, pelletized chlorine)
3. Check final chlorine residual.

7. Pump and Pressure Tank Installation

- a. What type of pumping equipment is proposed? (submersible, jet pump, rod pump, hand pump)
- b. How will the casing be terminated? (pitless adapter, well house, basement offset)
- c. Is proposed pump size adequate to meet needs of facility?
- d. Does proposed pressure tank have adequate drawdown?
- e. Is plastic piping material approved for potable water usage and is pressure rating adequate?

8. Sanitary Procedures

- a. Is the contractor using procedures that will reduce the introduction of bacteria or other undesirable substances into the water supply? (Removing excess pipe dope, using clean well screen and drop pipe, elevating pipes off of ground surface, using clean rags and gloves, disinfecting gravel pack material, etc.)

9. Abandoned Wells

- a. Is there an abandoned well on the site that should be properly plugged?

10. Recommended Field Equipment for Drilling Site Evaluations

- a. Hard hat
- b. Steel-toed work shoes or boots

- c. Safety glasses
- d. Coveralls
- e. Tape measure
- f. Flashlight
- g. Mirror
- h. Drop string with weight
- i. Water level indicator
- j. 5 gallon pail (white)
- k. Chlorine test kit and test papers
- 1. Grout probe
- m Shovel
- n. Mud scale
- o. Sample containers

RANDOM CONSTRUCTION INSPECTION CHECKLIST

Owner _____ Site Address _____

Permit Number _____

A. PERMITS

1. Was permit issued? ☐ YES ☐ NO
2. Were there any permit restrictions or conditions? ☐ YES ☐ NO
3. Is the water well drilling contractor aware of the permit conditions? ☐ YES ☐ NO

B. CONTRACTOR REGISTRATION

1. Is the water well drilling contractor registered? ☐ YES ☐ NO
2. Is the drilling rig properly registered and identified with DEQ decals, registration number, business name, and address on both sides of the rig, in letters at least 2 inches high? ☐ YES ☐ NO

C. DRILLING SITE LOCATION

1. Is the water well location adequately isolated from sources of contamination. ☐ YES ☐ NO
2. Does the location comply with permit conditions? ☐ YES ☐ NO
3. Will the water well be accessible for maintenance? ☐ YES ☐ NO
4. Is the water well in a nonflooding location? ☐ YES ☐ NO

D. DRILLING METHOD

1. What type of drilling method is being used?

Rotary _____ Cable Tool _____ Auger _____ Hollow Rod _____ Jetting _____ Driving _____
Combination _____ Other _____

E. WATER WELL RECORDS

1. Is the water well driller routinely checking cuttings samples and recording geologic information? ☐ YES ☐ NO

F. WATER WELL CONSTRUCTION DETAILS

1. **Well Type:** Sand or Gravel (unconsolidated) _____ Bedrock (consolidated) _____

2. Grouting:

a. Type _____ Manufacturer _____ Product Name _____

b. Is the mud scale used to weigh grout? ☐ YES ☐ NO

c. What grouting method will be used?

Grout pipe in annulus _____ Grout pipe inside casing _____ Displacement method _____
Other _____

d. Does the water well drilling contractor have necessary grouting equipment (mixer, pump, grout pipe, hoses) and materials at the drilling site? ☐ YES ☐ NO

e. Did grout appear at the wellhead after pumping? ☐ YES ☐ NO

Weight of grout at surface: _____ lbs./gal Weight of grout before pumping: _____ lbs./gal.

f. If the water well casing is driven (cable tool, jetting, hollow rod), is dry granular bentonite placed around the casing during driving? ☐ YES ☐ NO

3. Water Well Casing

a. Type of well casing: PVC ___ Galvanized steel ___ Black steel ___ Other _____

b. Casing material approved? ☐ YES ☐ NO

4. Water Well Screen

a. Type of screen: PVC ___ Stainless steel ___ Other _____

b. Installation method: telescoped _____ attached to casing _____

c. Filter-pack installed? ☐ YES ☐ NO

d. Filter-pack chlorinated? ☐ YES ☐ NO ☐

5. Drilling Water

a. Source approved? ☐ YES ☐ NO

b. Drilling water chlorinated to at least 10 ppm residual? ☐ YES ☐ NO

6. Water Well Development

a. Development method used: air _____ surge block _____ bailer _____
plunger _____ water jetting _____ overpumping _____

b. Approximate water well capacity (use 5 gallon pail): _____ gallons per minute

c. Water free of sand or other turbidity upon completion of the development? ☐ YES ☐ NO
(Check with clean white pail or clear jar)

7. Water Well Disinfection

a. Water well disinfected upon completion? ☐ YES ☐ NO

b. Method and amount of disinfectant adequate? ☐ YES ☐ NO

c. Final chlorine residual in well _____ ppm (Check w /chlorine test strips)

8. **Approved temporary cap?** ☐ YES ☐ NO

Comments: _____

Evaluated by _____ Date: _____ Reinspection Date: _____

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER BUREAU
DRINKING WATER AND ENVIRONMENTAL HEALTH SECTION –WELL CONSTRUCTION UNIT

MINIMUM WELL ISOLATION DISTANCES
(From Contamination Sources and Buildings)
Part 127, Act 368, P.A. 1978 And Act 399, P.A. 1976

The following lists sources of contamination and the well isolation distances required from those sources by state codes. The Michigan Department of Environmental Quality and local health departments have authority to issue deviations from these minimum isolation distances on a case by case basis. Criteria for issuance of deviations are set forth in R 325.1613 of the Rules for Part 127, and R 325.10809 of the Rules for Act 399.

* = For the isolation distances marked with a single asterisk, the isolation distance is for a source of contamination which is not specifically listed in the rules. However, the source of contamination is interpreted as belonging in a general contamination source group (example - a sewage holding tank is the same as a septic tank) which is listed in the rules, and therefore, the isolation distance listed in this document is required.

** = For the isolation distances marked with a double asterisk, the isolation distance is from a source of contamination which is not specifically named in the rules. However, the Michigan Department of Environmental Quality has established a recommended isolation distance based on the contaminant involved, the risk to public health, and other factors. Under the general authority of a health officer's responsibility to protect the public health, health officers may modify this recommended isolation distance, either increasing or decreasing it, on a case by case basis.

REQUIRED MINIMUM ISOLATION DISTANCE (FEET)			
Contamination Source	Part 127, Act 368 PA 1978	Act 399, PA 1976	
		IIb and III	I and IIa
Agricultural chemical/ fertilizer storage or preparation area	150	800	2000
Animal/poultry yard	50	75	200
Brine wells/injection wells	**150	**800	**2,000
Building or projection thereof	3	3	3
Cemetery/graves	**50	*75	*200
Cesspool	50	75	200
Chemical Storage	150	800	2,000
Contaminant plumes, known (Act 307, LUST sites, etc.)	**150	**800	**2,000
Drainfield	50	75	200
Drywell	50	75	200
Footing Drains	10	10	10
Fuel/chemical storage tanks – Underground or abovegrade and associated piping			
depot/tank farm	300	800	2,000
1,100 gal. or larger, without secondary	300	800	2,000

containment			
1,100 gal. or larger with secondary containment	50	800	2,000
less than 1,100 gal. which store motor or heating fuel for noncommercial purpose or consumptive use on premises where fuel is stored	50	800	2,000
less than 1,100 gal. which store motor fuel for commercial purpose	*50	800	2,000
located in a basement, regardless of size	*50	800	2,000
Grease trap	50	*75	*200
Kennels	50	*75	*200
Landfill or dump sites (Active or inactive)	800	800	2,000
Liquid Petroleum (LP) Tanks (See comments on last page)			
Liquid waste draining into the soil	50	*75	200
Metering station for pipelines	*300	*300	*300
Municipal wastewater effluent or sludge disposal area (land surface application or subsurface injection)	300	800	2,000
Oil or gas wells	300	300	300
Other wastewater handling or disposal unit	50	*75	*200
Petroleum product processing or bulk storage	300	800	2,000
Pipelines			
gas, oil, etc.	*300	*300	*300
natural gas (See comments on last page)			
Privy/Outhouse	50	75	200
Seepage pit	50	75	200
Septic tank	50	75	200
Septage waste (land application area)	800	800	2,000
Sewage holding tank	50	*75	*200
Sewage lagoon serving a single family dwelling	50	75	200
Sewage lagoon effluent – land application area	50	800	2,000
Sewage or liquid waste draining into soil	50	*75	*200
Sewage pump chamber, transfer station, or lift station	50	75	200

Sewers			
Buried gravity sewer (sanitary or storm) - Service weight or heavier ductile-iron or cast iron, or schedule 40 PVC, all with watertight joints	10	75	200
Buried pressure sewer (sanitary or storm) Watertight joints (pressure tested after installation to 100 psi), equivalent to Schedule 40 or SDR 21, and meets or exceeds ASTM Specifications D1785-91 or D2241-89	10 (by written deviation only)	75	200
Buried gravity or pressure sewer (sanitary or storm), constructed of materials not meeting the specifications listed in the two categories above, or the materials are unknown	50	75	200
Sump pit			
Receiving other than household waste (footing drain, roof drain, etc.)	10	10	10
Receiving household waste (laundry, softener backwash, sink waste, etc.)	50	75	200
Surface water (lake, river, stream, pond, ditch, etc.)	10	75	200
Unfilled space below ground surface (except an approved basement, basement offset, or crawl space beneath single family dwelling)	10	10	10

Comments: Natural gas and liquid petroleum (LP) are not considered sources of ground water contamination because of the volatile gas nature of the fuels. If leaks occur, the gases escape into the atmosphere. Leaked gases do not migrate downward into the soil. Wells should be sufficiently isolated from natural gas lines or LP tanks to minimize the potential for damage to the lines or tanks during well construction or repair, trenching of water lines, etc., and to allow accessibility to the well.

DEVIATIONS

(Local Health Department Activities)

Local Health Departments have authority to issue deviations for **minimum isolation distances** for individual well installations. Criteria for issuance of deviations are set forth in R325.1613 and are listed below:

Rule 113. (1) A health officer may issue a deviation if the spirit and intent of these rules are observed and the public health, safety, and welfare are assured.

Water service line to remain not in compliance with the provisions of these rules when extensive changes or repairs to a water supply system are made if the water service line is located beneath a permanent structure or pavement.

A well may be located closer to a potential or known source of contamination if the dimensions of the property do not permit compliance and if any of the following conditions exist:

- Groundwater flow direction is away from the well.
- The depth of the well and depth of grouting will provide protection of groundwater quality and the public health.
- The well is replacing a well on a site where a habitable structure exists.

A well may be required to be located more than the specified minimum distance from a source of contamination if the minimum specified distance will not protect groundwater quality or the public health due to local groundwater conditions, geology, or other factors.

10 feet to a pressurized sewer that meets all of the following requirements:

- pressure tested, not less than 100 pounds per square inch and watertight
- ASTM specification D 1785-91 or D 2241-89
- schedule 40 or SDR 21

A health officer may require a study of the hydrogeological conditions of a site to support a deviation issued pursuant to the provisions of this subrule.

3 feet to a building if all of the following conditions exist:

- well is a replacement well
- can not meet minimum distance
- access for maintenance

Casing less than 25 feet below the ground surface if the well will not be used to supply water to habitable structures or for human consumption and if both of the following conditions exist:

- water supply system are identified as not being suitable for human consumption
- water supply system are separated from any potable water supply system

Casing less than 25 feet below the ground surface if there is reason to believe that potable water of suitable quantity does not exist at a reasonable depth of more than 25 feet and if either of the following conditions exists:

- isolation distance is increased
- a confining layer is present above the aquifer.

Length of casing to be grouted for rotary-bored or augered wells to be decreased if the well is more than 100 feet deep and if a confining layer is not penetrated.

Casing extend more than 25 feet below the ground surface if there is reason to believe that nonpotable water is or may be present in the upper bedrock.

Flowing well discharge:

- Control of the flow is not practical.
- Control of the flow will likely result in the production of sand or turbidity in the water.
- The discharge is for a beneficial use.

Deviations from the rules shall be made, in writing, by a health officer and shall state the reasons for each deviation. A health officer may require special well construction features as a condition for the issuance of a deviation and may require well construction features that are more stringent than these rules when deemed necessary to protect the groundwater quality or the public health. Reasons for the issuance of a deviation or special well construction features as a condition for the issuance of a deviation by a health officer shall be based upon any of the following factors:

- Site hydrogeology
- Site topography
- Site dimensions
- Soil characteristics
- Depth of well
- Type of well
- Well pumping rate
- Well drilling method
- Distance from contamination sources
- Presence of groundwater contamination
- Other similar factors